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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/579,038

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Ryoichi Shimoi

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EXAMINER

LEONG, JONATHAN G

ART UNIT

PAPER NUMBER

1725

MAIL DATE

DELIVERY MODE

03/15/2011

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/579,038

Applicant(s)

SHIMO ET AL.

Examiner

JONATHAN G. LEONG

Art Unit

1725

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 January 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) 1-7, 11 and 12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-10 and 13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 8-10 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Mizuno (JP H07-201346, see machine Translation) as evidenced by Wood et al. (Nafion Structural Phenomena at Platinum and Carbon Interfaces).

Regarding claims 8 and 13, Mizuno discloses an electrolytic membrane structure and a fuel cell comprising the same ([0015], Fig. 1), wherein an electrolytic membrane is placed between an electrode in an anode side and an electrode in a cathode side ([0015]/L4-8); the electrolytic membrane comprising a catalyst layer (catalyst reaction layer, [0015]/L4) formed by closing up conductive particles adhered together carrying catalysts on each face, in the anode side and in the cathode side, of the electrolytic membrane, the each face contacts to each of the electrodes ([0015]/L4-10, [0023]/L1-5, Fig. 1); and a boundary layer (fire-resistant layer, [0016]/L3) which is adjacent to the catalyst layer in the anode side on one face of the electrolytic membrane ([0016]/L3-5) and is formed between a portion to be easily contacted with an oxygen gas and the catalyst layer in the anode side (see Fig. 3), wherein the boundary layer is formed by closing up the conductive particles adhered together to which a hydrophilic treatment is carried out (the carbon particles are made into a paste using NAFIONTM which is the same material used for the membrane of the fuel cell, as such, the carbon particles are

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inherently granted hydrophilic properties when made into said paste, [0023]/L6-10, [0017]/L6-7).

The Examiner notes that since Mizuno has disclosed all of the claimed structural limitations, Mizuno inherently discloses whereby water generated by the electrochemical reaction is held in the boundary layer, increasing heat conductivity of the boundary layer; whereby an increase of the electrochemical reaction of un-reacted gases results in a border vicinity of the boundary layer; and, whereby heat generated in a border vicinity of the catalyst layer adjacent to the boundary layer escapes to the boundary layer containing the water. The Examiner further notes that while features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function (see MPEP 2114).

While Mizuno does not explicitly disclose that the conductive particles have a water repellent characteristic, the conductive particles of Mizuno necessarily have a water repellent characteristic since the NAFIONTM resin which is in contact with the conductive particles ([0023]) comprises a hydrophobic polymer backbone, which, in a broad sense, represents a water repellent characteristic. As the specification does not appear to contain a special definition for "water repellent characteristic", the Examiner has taken said claim limitation with a broad and reasonable interpretation wherein the term "characteristic" refers to "an attribute". Since the hydrophobic polymer backbone is a necessary part of the structure of NAFIONTM, said hydrophobic polymer backbone reads on the claim limitation "water repellent characteristic". Assuming, *arguendo*, that

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such an interpretation is unreasonable, the Examiner notes that the catalyst layer conductive particles disclosed by Mizuno, e.g. platinum supported on carbon particles ([0023]), is substantially the same as that in the instant invention (e.g. original instant specification. P5/L16, L30), thus, the conductive particles of Mizuno would necessarily share substantially the same properties as the conductive particles of the instant invention. Assuming, *arguendo*, that both of the above interpretations are unreasonable, the Examiner notes that NAFION™, when formed on platinum, becomes hydrophobic as evidenced by Wood et al. (P18103/Conclusions/L8-9), thus representing a water repellent characteristic.

Regarding claim 9, Mizuno discloses all of the claim limitations as set forth above. Mizuno further discloses the boundary layer is formed so as to surround a periphery of the catalyst layer, where is easily contacted with the oxygen gas ([0016]/L3-5, Fig. 3).

Regarding claim 10, Mizuno discloses all of the claim limitations as set forth above. Mizuno further discloses the boundary layer is formed between a portion in the vicinity of a penetrating passage by which the oxygen gas is supplied to the cathode side which is easily contacted with the oxygen gas, and the catalyst layer (for example, the boundary layer, subjected to oxygen crossover via the membrane, is formed between the catalyst layer and the membrane which is in the vicinity of the oxygen gas channel, see Fig. 1, [0016]/L3-5, Fig. 3).

Response to Arguments

3. Applicant's arguments filed 1/24/2011 have been fully considered but they are not persuasive.

Applicant argues that the catalyst layer conductive particles of Mizuno do not have a water repellent characteristic.

The Examiner respectfully submits that while Mizuno does not explicitly disclose that the conductive particles have a water repellent characteristic, the conductive particles of Mizuno necessarily have a water repellent characteristic since the NAFIONTM resin which is in contact with the conductive particles ([0023]) comprises a hydrophobic polymer backbone, which, in a broad sense, represents a water repellent characteristic. As the specification does not appear to contain a special definition for "water repellent characteristic", the Examiner has taken said claim limitation with a broad and reasonable interpretation wherein the term "characteristic" refers to "an attribute". Since the hydrophobic polymer backbone is a necessary part of the structure of NAFIONTM, said hydrophobic polymer backbone reads on the claim limitation "water repellent characteristic". Assuming, *arguendo*, that such an interpretation is unreasonable, the Examiner notes that the catalyst layer conductive particles disclosed by Mizuno, e.g. platinum supported on carbon particles ([0023]), is substantially the same as that in the instant invention (e.g. original instant specification. P5/L16, L30), thus, the conductive particles of Mizuno would necessarily share substantially the same properties as the conductive particles of the instant invention. Assuming, *arguendo*, that both of the above interpretations are unreasonable, the Examiner notes that

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NAFIONTM, when formed on platinum, becomes hydrophobic as evidenced by Wood et al. (P18103/Conclusions/L8-9), thus representing a water repellent characteristic.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JONATHAN G. LEONG whose telephone number is (571) 270-1292. The examiner can normally be reached on M-Th 8:00 AM - 5:00 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Basia Ridley can be reached on (571) 272-1453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. G. L./
Examiner, Art Unit 1725
3/8/2011

/Basia Ridley/
Supervisory Patent Examiner, Art Unit 1725